

LISTING OF THE CLAIMS

1 (currently amended): High-strength steel sheet excellent in hole-expandability and ductility, characterized by;

comprising, in mass%,

C: not less than 0.01 % and not more than 0.20 %,

Si: not more than 1.5 %,

Al: not more than 1.5 %,

Mn: not less than 0.5 % and not more than 3.5 %,

P: not more than 0.2 %,

S: not less than 0.0005 % and not more than 0.009 %,

N: not more than 0.009 %,

Mg: not less than 0.0006 % and not more than 0.01 %,

O: not more than 0.005 % and

Ti: not less than 0.01 % and not more than 0.20 % and/or

Nb: not less than 0.01 % and not more than 0.10 %,

with the balance ~~consisting~~ being iron and unavoidable impurities,

having the Mn%, Mg%, S% and O% satisfying equations (1) to (3), and

having the structure primarily comprising one or more of ferrite, bainite and martensite,

containing not less than 5.0×10^2 per square millimeter and not more than 1.0×10^7 per square millimeter of composite precipitates of MgO, MgS and (Nb, Ti)N of not smaller than $0.05 \mu\text{m}$ and not larger than $3.0 \mu\text{m}$,

$$[\text{Mg}\%] \geq ([\text{O}\%]/16 \times 0.8) \times 24 \quad \dots (1)$$

$$[\text{S}\%] \leq ([\text{Mg}\%]/24 - [\text{O}\%]/16 \times 0.8 + 0.00012) \times 32 \quad \dots (2)$$

$$[S\%]\leq 0.0075/[Mn\%] \quad \dots (3).$$

Claim 2: (canceled).

3 (original): High-strength steel sheet excellent in hole-expandability and ductility described in claim 1, characterized by having Al% and Si% satisfying equation (4)

$$[Si\%]+2.2\times[Al\%]\geq 0.35 \quad \dots (4).$$

Claim 4: (canceled).

5 (previously presented): High-strength steel sheet excellent in hole-expandability and ductility described in claim 1, characterized by;

having Ti%, C%, Mn% and Nb% satisfying equations (5) to (7),

having the structure primarily comprising bainite, and

having a strength exceeding 980 N/mm²

$$0.9\leq 48/12\times[C\%]/[Ti\%]<1.7 \quad \dots (5)$$

$$50227\times[C\%]-4479\times[Mn\%]>-9860 \quad \dots (6)$$

$$811\times[C\%]+135\times[Mn\%]+602\times[Ti\%]+794\times[Nb\%]>465 \quad \dots (7).$$

6 (withdrawn): High-strength steel sheet excellent in hole-expandability and ductility described in claim 1, characterized by;

having C%, Si%, Al% and Mn% satisfying equation (8),

having the structure primarily comprising ferrite and martensite, and

having a strength exceeding 590 N/mm²

$$-100\leq -300[C\%]+105[Si\%]-95[Mn\%]+233[Al\%] \quad \dots (8).$$

7 (withdrawn): High-strength steel sheet excellent in hole-expandability and ductility described in claim 6, characterized in that;

not less than 80 % of crystal grains having a short diameter (ds) to long diameter (dl) ratio (ds/dl) of not less than 0.1 exist in the steel structure.

8 (withdrawn): High-strength steel sheet excellent in hole-expandability and ductility described in claim 7, characterized in that;

not less than 80 % of ferrite crystal grains having a diameter of not less than 2 μm exist in the steel structure.

9 (previously presented): High-strength steel sheet excellent in hole-expandability and ductility described in claim 1, characterized by;

having C%, Si%, Mn% and Al% satisfying equation (8),

having the structure primarily comprising ferrite and bainite, and

having the strength exceeding 590 N/mm^2

$-100 \leq -300[\text{C}\%] + 105[\text{Si}\%] - 95[\text{Mn}\%] + 233[\text{Al}\%] \quad \dots (8).$

10 (original): High-strength steel sheet excellent in hole-expandability and ductility described in claim 9, characterized in that;

not less than 80 % of crystal grains having a short diameter (d_s) to long diameter (d_l) ratio (d_s/d_l) of not less than 0.1 exist in the steel structure.

11 (original): High-strength steel sheet excellent in hole-expandability and ductility described in claim 10, characterized in that;

not less than 80 % of ferrite crystal grains having a diameter of not less than 2 μm exist in the steel structure.

Claims 12 to 15: (canceled).